

ABOUT DISTASTEFULNESS AND MIMICRY: A COMMENT ON PETER SMETACEK'S ARTICLE
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I am writing in response to Smetacek's (2006) conclusion that *Papilio polyctor*, *P. protenor*, and *P. polytes* are distasteful to avian predators and thus chemically defended. Smetacek's experiment on butterflies and wild birds was an immense effort involving years of observations, which I highly appreciate. However, the results presented in his article are interesting and suggestive, not conclusive.

Smetacek's study had limited experimental controls, which compromised reliability of the small dataset. The methods did not fully describe motivational states and prior experiences of the birds, and how these factors were controlled or contributed to the data. These are key aspects of palatability experiments and must be addressed in order to draw conclusions from the predators' behavior. The article mentioned, "The birds at times arrived and devoured everything in sight and at other times ignored everything, including controls, having evidently found sufficient food elsewhere." We do not know how much of the variation in measured palatability was introduced by this lack of control, motivational states of the birds and their prior experience with unpalatable prey.

The author's explanation for persistence of the non-mimetic female form of *P. polytes*—that it persists because it is distasteful—conflicts with earlier data. Ohsaki (1995, not cited in Smetacek 2006) has shown that in nature a much higher percentage of non-mimetic females of *P. polytes* have beak marks on their wings compared to the mimetic females. Ohsaki's data suggests that the non-mimetic female form is palatable

and suffers higher rates of predatory attack, whereas the mimetic female form is attacked much less frequently and has a Batesian mimetic advantage. Moreover, the nature of female-limited mimic–non-mimic polymorphism and variation in frequencies of female forms over most of the geographic range of *P. polytes* is in line with theories of Batesian polymorphism, not Müllerian polymorphism. Thus, based on theory and empirical evidence, balanced polymorphism and other traditional explanations (e.g. Turner 1978, and references therein) still seem more satisfactory in explaining the mimic–non-mimic polymorphism in *P. polytes*. Parallel mimic–non-mimic polymorphism in *P. glaucus* and other *Papilio* species is also instructive.

The idea—that a classic Batesian mimic is actually a Müllerian mimic—is intriguing but controlled experiments are required before a definitive conclusion can be reached.

LITERATURE CITED

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AUTHOR'S RESPONSE TO TECHNICAL COMMENT

First, all *Papilio* larvae are believed to be unpalatable, as stated in the Introduction of my paper. On the basis of the data presented, I concluded that *P. polytes*, *polyctor* and *protenor* are also distasteful in the adult stage.

Concerning the misgiving about limited experimental controls compromising the reliability of the small dataset, the normally acceptable ratio is 1:1; this has been exceeded in my experiments as noted in Column 2 of Table 1. As stated, the *Papilio* species were offered together with the controls. Therefore, it made little

difference to the result of the experiments whether the birds arrived hungry or sated. Perusal of the paper will show that the number of times the birds ignored the presentation does not in any way affect the interpretation of data.

With reference to the contention that I have not fully described "motivational states and prior experiences" of the birds and "how they were controlled or contributed to the data", all information that was noteworthy on this subject may be found in the last two paragraphs of the Materials and Methods section. My limited